SERSIA MIDATEST
SOCIETE OUGANDAISE CAPRINE
CIRAD-EMVT

PROPOSALS FOR A DAIRY GOATS PILOT-SCHEME IN UGANDA
Pre-faisability study[1]

Working paper

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[1] *Working paper L.LETENNEUR et S. KLOTZ. CIRAD- EMVT*

1. PROJECT JUSTIFICATION

The Ugandian goats population is over 6 300 000 animals and provides about 22 % of the country meat consumption. A rough survey at the Kampala market showed that in average, every butcher sells daily, 6 to 7 goat carcasses for 1 cattle carcass. In average, the goat carcass weight is about 9 to 10 kg. In spite of these low weights, the animal productivity would be about 4.3 kg per head. It is more than in many subsaharian African countries (3.3 kg in average). These data should be specified with a regional or, if possible, national productivity survey.

The national goat demand is confirmed by the exportations acquisitions which will reinforce themselves both on living animals and meat.

The goat production research and development programs managed in Burundi and Rwanda showed that the crossbreeding of the local goat with the « Alpine » goats for milk and meat production improvement was very interesting :

- The local male average live weights were 17 and 30 kg for the 1 and 2 years old animals. For the ¾ « Alpine » same age animals in identically bred conditions, weights were 30 and 50 kg.2.

- This crossbreeding interest for goat meat production herds was completed with the goat dairy capacity improvement. The lactation average recorded in Burundi (Ngozi Project) was 398 liters over a 225 day period for the « Alpines » and 227 liters over a 209 day period for the F1s.

A goat dairy production project can be achieved at one condition i.e a goat dairy production market does exist : milk and cheese.

- In relation with the poor local goat dairy predisposition, milk goat consumption is low in many subsaharian African countries. Generally, the milk is suckled by kids. Its excess is reserved to old and ill people. Moreover, milk goat therapeutic properties, known for a long time by Ugandian people, are nowadays carefully examined by some European scientists. French researchers associate goat milk consumption with cancer fighting programs. Some experiences are managed at the Rennes Medicine University.

- When milk is produced in sufficient quantity, it does not seem to be over produced (milk or cheese). In Uganda, goat cheese is imported and is especially expensive in Kampala. So this market is reserved to high income people.

[2] KLOTZ Stéphane, Identification of technical basis adapted to the improved goats breeding in the Mumirwa zone. Ministry of Agriculture of Burundi. 1993, 53 pages and annexes.

The implementation of a goat project presents three interesting points :

- To satisfy and improve the local market in adapting the products to the actual and future demand :
    - substitution of imported products,
    - conception of new products for the local market,
    - new therapeutic market.
- To breed reproductive males for crossbreeding operations in farming areas with local goats in order to increase their meat productivity.
- To start up in farming areas a goat dairy production program in order to produce farm cheeses.
- To favour the implementation of a private center to multiply and adapt pure « Alpine » goats destined to ensure the project future.

2. PROJECT CONTENTS

The project will be based on two mainly structures :

- *A private reproduction and adaptation center for exotic goat with production and dairy processing.*
  This center will also produce pure reproductive goats to the best herds of the pilot area and, in a first phase, will be able to be a collection and processing center for neighbouring farms.
    - The size and the expected productions of this center are presented in the annex 1. At the beginning, it will operate with 75 to 80 imported reproductive animals. It will hold about 400 animals under normal conditions. The center will be able to produce per year, about 50 male goats and 88 000 liters of milk.
    - At first, the « Alpine » race is the exotic race proposed for the genetic improvement.
- *A pilot zone for the goat production and genetic improvement*, gathering - like a breeder association for example - the interested breeders. In this area, the crossbreeding of the local goats will be accomplished with the reproductive animals coming from the pilot-scheme and the implementation of an artificial insemination program. The goat herds will be monitored and controlled by recording growth and dairy production performances. This will authorize the creation of a goat reproductive pool for the selection and especially the crossbred animals.

- For the motivated breeders. a pilot operation for dairy production in farming areas will be organized.

- The breeders who will not milk their animals will benefit from the genetic aptitude for meat production of their « Alpine » race reproductive herd. The number of goats could increase from 500 to 1500 between the 1st to the 3rd or 4th year.

3. OPERATION RESOURCE ESTIMATE

3.1. HUMAN RESOURCES

The European Union support will be limited during the project period and will decrease every year in relation with the professional increasing involvement.

This operation will be performed under the control of official services : Ministry of Agriculture (Division of health and animal production) for the definition of genetic programs, livestock sanitary and dairy products trade controls.

However, in relation with its innovating aspects, it is necessary that the technical, scientific and logistic supports be ensured in the best conditions during three years. This support will be provided by four different and complementary action types :

- Presence of a goat specialist knowing dairy product processing who will be in charge of :

  - supporting the start and implementation of the imported goat breeding center : housing, feeding, breeding management, sanitary and performance monitoring, adaptation and selection of the imported animals,

  - participating in the conception of goat dairy product processing in relation with the demand,

  - implementing the goat livestock improvement pilot-scheme in farming areas and technical monitoring organization,

  - participating in the training of the assistants in charge of monitoring in farming areas and breeding center supervisor.

  - Participating in the project goat breeder's structuring.

For regular farm monitoring, during the first years, a technician for about 500 goats is expected. These technicians will work under the goat specialist.

- Support of NAARO and CIRAD-EMVT for the scientific monitoring,

- Private European groups participation for the genetic improvement program (reproductive animals and implementation of an artificial insemination program), dairy processing and goat breeders structuring,

- At least and above all, participation of Ugandian groups for the implementation of the breeding and adapting reproductive center.

3.2. LOGISTIC RESOURCES

- Transport means
  - 1st year : a pick-up truck
    a moped
  - 2nd and 3rd year : 2 mopeds
- Improvement genetic program participation
  - support for the acquisition of breeding center reproductive animals,
  - basic artificial insemination equipment,
  - participation for the acquisition of the semen and consumables for the goat insemination in farming areas,
  - participation for the pilot-center investments.
- Computer equipment
  - A microcomputer, herd monitoring and office software.

3.3. FINANCIAL RESOURCES

The desirable European Union financial participation is presented in the following table.

DESIRABLE EUROPEAN UNION FINANCIAL PARTICIPATION (in French Francs)

	Year 1			Year 2			Year 3		
	Quantity	Unity price	Total	Quantity	Unity price	Total	Quantity	Unity price	Total
Investment supports (20 %)									
Reproductive animal herd acquisition	1	63 000	63 000						
Other investments	1	112 078	112 078						
Artificial insemination									
Kits	3	2 500	7 500						
Semen, sponges, hormones	1 000	48	48 000	2 000	45	90 000	2 000	36	72 000
Technical support CIRAD-EMVT mission	1	39 744	39 744	1	24 840	24 840	1	24 840	24 840
NAARO livestock monitoring	1	50 000	50 000	1	50 000	50 000	1	50 000	50 000
Technical assistance : Breeding Technician*	1	405 000	405 000	1	337 500	337 500	1	270 000	270 000
Travel means									
Vehicle	1	120 000	120 000	1	5 000	5 000	1	5 000	5 000
Moped	1	5 000	5 000						
Running costs	1	30 000	30 000	1	35 000	35 000	1	40 000	40 000
TOTAL			**880 322**			**542 340**			**461 840**

* The expert costs are based on French Foreign Office prices

ANNEXE 1

TECHNICAL AND FINANCIAL BASIS OF THE PRE-FEASABILITY STUDY FOR A DAIRY GOAT PILOT-SCHEME IN UGANDA

Working paper CIRAD-EMVT L. LETENNEUR / S. KLOTZ

The following tables give the base references for the investments and running costs of a goat dairy production center in Uganda. An estimate of the livestock development perspectives is described for the first six years of the project.

The following points are described :

- The breeding zootechnical parameters,
- The yearly herd numbers,
- A first estimate of the investments to realize,
- A first estimate of the running charges,
- An animal exploitation summary,
- A production summary,
- A simplified financial balance-sheet.

Remarks :

- The animals will be bred in a complete indoors keeping system,
- All prices are in French Francs.

1. Zootechnical breeding parameters

They include :

- First year : animal numbers, fecundity and mortality,
- Following years : fecundity, exploitation rates, mortality rates, animal weights and their price by kg of live weight.

2. Yearly herd numbers

They are described for males and females. The weights, values and herd growth rates are showed. The yearly herd total number is presented.

3. Investments required estimate

The investments include the breeding buildings (yearly increasing), first reproductive animals acquisition, dairy, breeding equipment, harnessing for feedcrops and transport, a generator.

4. Running costs estimate

These charges are made of the costs in relation with feedcrops (implementation, upkeeping, harvest), complementing feeds (vitaminized and mineral mixture, concentrates), veterinary drugs, working charges, building upkeeping and electricity.

5. Animals exploitation summary

These tables present yearly the reproductive and slaughtering animal sales. They differentiate the numbers, weights and values of the exploited animals (males and females). A summary is provided for the first six years.

6. Production summary

The total animal production sales from the center are summarized in these tables. They show :

- Dairy production sales : several levels of the milk liter selling price are given : 5 FF, 8 FF, 10 FF et 16 FF [3].
- Animals sales for reproduction and slaughtering. The price is 20 FF/kg of live weight.

7. Simplified financial balance-sheet

This balance sheet includes investments, running charges and herd products.

This balance-sheet is presented as an example without the capital change (about 300 000 FF for the six years) and without the dairy processing add-value.

[3] For example : 4 goat milk liters processed give about 16 « crottins » of 60 grammes. These « crottins » would have a selling price of 4 FF for 1 milk liter which costs 16 FF.

Zootechnical breeding parameters

Parameters for t = 0

Age	Number of male	Number of female	Fecondity	Male exploitation	Female exploitation	Male mortality	Female mortality
0*				0	0	0	0
0	0	0	0	0	0	0	0
1	20	160	1,5	0	0	0,15	0,15
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0

Parameters for t = 1 and so

Age	Fecondity	Male exploitation	Female exploitation	Male mortality	Female mortality	Male acquisition	Female acquisition	Male weight	Femelle weight	Male value	Female value
0*		0	0	0	0						
0	0	0,35	0	0,2	0,2	0	0	25	20	20	20
1	1,2	0,5	0,1	0,1	0,1	0	0	45	35	20	20
2	1,5	0,7	0,1	0,1	0,1	0	0	60	45	20	20
3	1,5	0,7	0,1	0,1	0,1	0	0	80	50	20	20
4	1,5	1	1	0,1	0,1	0	0	80	60	20	20

Annual herd number

Male numbers per year and per age

	Year					
Age	1	2	3	4	5	6
0	0	120	102	139	172	162
1	20	0	54	46	63	77
2	0	18	0	22	18	25
3	0	0	3	0	4	4
4	0	0	0	1	0	1
Total	20	138	159	207	257	269
Weight	0	4 020	5 252	6 896	8 562	9 392
Value	0	80 400	105 040	137 918	171 240	187 848
Growth [t-1,t[	0	117	22	48	50	12
Growth rate	0	585%	16%	30%	24%	5%

Female numbers per year and per age

Age	1	2	3	4	5	6
0	0	120	102	139	172	162
1	160	0	96	82	111	137
2	0	136	0	77	65	89
3	0	0	109	0	61	52
4	0	0	0	87	0	49
Total	**160**	**256**	**307**	**385**	**410**	**490**
Weight	0	8 520	10 840	14 318	13 344	17 618
Value	0	170 400	216 800	286 368	266 880	352 358
Growth [t-1,t[	0	96	51	78	25	80
Growth rate	0	60%	20%	25%	7%	19%

Male and Female numbers per year and per age

	Year					
Age	1	2	3	4	5	6
0	0	240	204	278	344	324
1	180	0	150	128	174	215
2	0	154	0	98	84	114
3	0	0	112	0	66	56
4	0	0	0	88	0	50
Total	**180**	**394**	**466**	**592**	**667**	**759**
Weight	0	12 540	16 092	21 214	21 906	27 010
Value	0	250 800	321 840	424 286	438 120	540 206

Animal exploitation summary

Exploitation by age between [2 , 3 [

Age	Exploited numbers			Exploited total weight			Exploited total value		
	Male	Female	Total	Mâles	Femelles	Total	Mâles	Femelles	Total
0*	0	0	0	0	0	0	0	0	0
0	42	0	42	1 470	0	1 470	29 400	0	29 400
1	0	0	0	0	0	0	0	0	0
2	12	14	26	833	646	1 479	16 660	12 920	29 580
3	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0
Total	**54**	**14**	**68**	**2 303**	**646**	**2 949**	**46 060**	**12 920**	**58 980**

Exploitation by age between [3 , 4 [

Age	Exploited numbers			Exploited total weight			Exploited total value		
	Male	Female	Total	Mâles	Femelles	Total	Mâles	Femelles	Total
0*	0	0	0	0	0	0	0	0	0
0	36	0	36	1 250	0	1 250	24 990	0	24 990
1	27	10	37	1 418	384	1 802	28 350	7 680	36 030
2	0	0	0	0	0	0	0	0	0
3	2	11	13	190	598	789	3 808	11 968	15 776
4	0	0	0	0	0	0	0	0	0
Total	**65**	**20**	**86**	**2 857**	**982**	**3 840**	**57 148**	**19 648**	**76 796**

Exploitation by age between [4 , 5 [

Age	Exploited numbers			Exploited total weight			Exploited total value		
	Male	Female	Total	Mâles	Femelles	Total	Mâles	Femelles	Total
0*	0	0	0	0	0	0	0	0	0
0	49	0	49	1 705	0	1 705	34 104	0	34 104
1	23	8	31	1 205	326	1 531	24 098	6 528	30 626
2	15	8	23	1 058	365	1 423	21 168	7 296	28 464
3	0	0	0	0	0	0	0	0	0
4	1	87	88	54	5 222	5 277	1 088	104 448	105 536
Total	**87**	**103**	**190**	**4 023**	**5 914**	**9 936**	**80 458**	**118 272**	**198 730**

Exploitation by age between [5 , 6 [

Age	Exploited numbers			Exploited total weight			Exploited total value		
	Male	Female	Total	Mâles	Femelles	Total	Mâles	Femelles	Total
0*	0	0	0	0	0	0	0	0	0
0	60	0	60	2 105	0	2 105	42 101	0	42 101
1	31	11	42	1 644	445	2 090	32 886	8 909	41 795
2	13	7	19	900	310	1 210	17 993	6 202	24 194
3	3	6	9	242	338	580	4 838	6 758	11 597
4	0	0	0	0	0	0	0	0	0
Total	**107**	**24**	**131**	**4 891**	**1 093**	**5 984**	**97 818**	**21 869**	**119 687**

Exploitation by age between [6 , 7 [

Age	Exploited numbers			Exploited total weight			Exploited total value		
	Male	Female	Total	Mâles	Femelles	Total	Mâles	Femelles	Total
0*	0	0	0	0	0	0	0	0	0
0	57	0	57	1 983	0	1 983	39 655	0	39 655
1	39	14	52	2 030	550	2 580	40 597	10 998	51 595
2	18	9	26	1 228	423	1 651	24 555	8 463	33 018
3	3	5	8	206	287	493	4 113	5 745	9 857
4	1	49	50	69	2 949	3 018	1 382	58 982	60 365
Total	**116**	**77**	**193**	**5 515**	**4 209**	**9 725**	**110 302**	**84 188**	**194 490**

Total exploitation

Age	Exploited numbers			Exploited total weight			Exploited total value		
	Male	Female	Total	Mâles	Femelles	Total	Mâles	Femelles	Total
0*	0	0	0	0	0	0	0	0	0
0	243	0	243	8 512	0	8 512	170 250	0	170 250
1	120	43	163	6 297	1 706	8 002	125 931	34 115	160 045
2	57	37	94	4 019	1 744	5 763	80 376	34 881	115 257
3	8	22	30	638	1 224	1 862	12 759	24 471	37 230
4	2	136	138	124	8 172	8 295	2 470	163 430	165 901
Total	**430**	**238**	**668**	**19 589**	**12 845**	**32 434**	**391 785**	**256 897**	**648 682**

Productions summary

Dairy Production

Age	1	2	3	4	5	6
1	70 400	0	42 240	35 904	48 998	60 488
2	0	83 300	0	47 040	39 984	54 566
3	0	0	66 640	0	37 632	31 987
4	0	0	0	53 312	0	30 106
Total (liters/year)	**70 400**	**83 300**	**108 880**	**136 256**	**126 614**	**177 147**
Value 5 FF/l	**352 000**	**416 500**	**544 400**	**681 280**	**633 072**	**885 734**
Value 8 FF/l	**563 200**	**666 400**	**871 040**	**1 090 048**	**1 012 915**	**1 417 175**
Value 10 FF/l	**704 000**	**833 000**	**1 088 800**	**1 362 560**	**1 266 144**	**1 771 469**
Value 16 FF/l	**1 126 400**	**1 332 800**	**1 742 080**	**2 180 096**	**2 025 830**	**2 834 350**

Meat and reproductive animal productions

Age	1	2	3	4	5	6
0	0	29 400	24 990	34 104	42 101	39 655
1	0	0	36 030	30 626	41 795	51 595
2	0	29 580	0	28 464	24 194	33 018
3	0	0	15 776	0	11 597	9 857
4	0	0	0	105 536	0	60 365
Total FF	**0**	**58 980**	**76 796**	**198 730**	**119 687**	**194 490**

Total productions

Age	1	2	3	4	5	6
Milk 5FF/l	352 000	416 500	544 400	681 280	633 072	885 734
Milk 8FF/l	563 200	666 400	871 040	1 090 048	1 012 915	1 417 175
Milk 10 FF/l	704 000	833 000	1 088 800	1 362 560	1 266 144	1 771 469
Milk 16 FF/l	1 126 400	1 332 800	1 742 080	2 180 096	2 025 830	2 834 350
Reproductiv	0	58 980	76 796	198 730	119 687	194 490
Total milk 5 FF/l	**352 000**	**475 480**	**621 196**	**880 010**	**752 759**	**1 080 224**
Total milk 8 FF/l	**563 200**	**725 380**	**947 836**	**1 288 778**	**1 132 602**	**1 611 665**
Total milk 10 FF/l	**704 000**	**891 980**	**1 165 596**	**1 561 290**	**1 385 831**	**1 965 959**
Total milk 16 FF/l	**1 126 400**	**1 391 780**	**1 818 876**	**2 378 826**	**2 145 517**	**3 028 840**

Running charges

Feedcrops squares (ha) / complete indoor breeding system

Age	1	2	3	4	5	6
0	0	10	8	11	14	13
1	18	0	15	13	17	21
2	0	15	0	10	8	11
3	0	0	11	0	7	6
4	0	0	0	9	0	5
Total ha	**18**	**25**	**34**	**42**	**46**	**56**

Harvest feedcrops manpower (man/day)

Age	1	2	3	4	5	6
0	0	3	3	3	4	4
1	6	0	5	4	5	7
2	0	5	0	3	3	4
3	0	0	3	0	2	2
4	0	0	0	3	0	2
Total m/d	**6**	**8**	**11**	**13**	**14**	**17**
Total FF/year	**40 500**	**56 250**	**77 355**	**95 621**	**103 696**	**126 977**

Feedcrops farming (ha)

	1	2	3	4	5	6
implementation	18	7	9	8	4	10
upkeeping	18	25	34	42	46	56
enrichment	18	25	34	42	46	56
Total FF	**66 600**	**38 500**	**52 206**	**54 103**	**43 029**	**70 544**

Concentrates, mineralized and vitamined mixture

Age	1	2	3	4	5	6
0	0	10 950	9 308	12 702	15 680	14 769
1	20 531	0	17 109	14 543	19 847	24 501
2	0	17 566	0	11 224	9 540	13 020
3	0	0	12 798	0	7 501	6 376
4	0	0	0	10 006	0	5 705
Total FF/year	**20 531**	**28 516**	**39 215**	**48 474**	**52 568**	**64 370**

Veterinary drugs

Age	1	2	3	4	5	6
0	0	6 000	5 100	6 960	8 592	8 093
1	4 500	0	3 750	3 188	4 350	5 370
2	0	3 850	0	2 460	2 091	2 854
3	0	0	2 805	0	1 644	1 397
4	0	0	0	2 193	0	1 250
Total FF/year	**4 500**	**9 850**	**11 655**	**14 801**	**16 677**	**18 964**

Other charges

	1	2	3	4	5	6
fuel/electricity	112 500	112 500	112 500	112 500	112 500	112 500
buildings upkeeping	8 500	8 500	8 500	8 500	8 500	8 500
herdsmen	26 280	57 524	68 065	86 435	97 394	110 751
farm supervisor	12 000	12 000	12 000	12 000	12 000	12 000
Total FF/year	**159 280**	**190 524**	**201 065**	**219 435**	**230 394**	**243 751**

Running charges summary

	1	2	3	4	5	6
Feedcrops harvest	40 500	56 250	77 355	95 621	103 696	126 977
Feedcrops farming	66 600	38 500	52 206	54 103	43 029	70 544
Concentrate feeds	20 531	28 516	39 215	48 474	52 568	64 370
Veterinary drugs	4 500	9 850	11 655	14 801	16 677	18 964
Other charges	159 280	190 524	201 065	219 435	230 394	243 751
Total FF/year	**291 411**	**323 640**	**381 496**	**432 433**	**446 364**	**524 606**
Miscellaneous 10 %	**29 141**	**32 364**	**38 150**	**43 243**	**44 636**	**52 461**
Total FF	**320 552**	**356 004**	**419 645**	**475 676**	**491 000**	**577 067**

Investments required

Building squares (m²)

	Year					
Age	1	2	3	4	5	6
0	0	240	204	278	344	324
1	520	0	396	337	459	567
2	0	444	0	274	233	317
3	0	0	333	0	193	164
4	0	0	0	262	0	149
Total m²	**520**	**684**	**933**	**1 151**	**1 229**	**1 521**
construction planning	**500**	**500**		**500**		
construction costs	**55 000**	**55 000**		**55 000**		
depreciation cost (FF)	**5 500**	**11 000**	**11 000**	**16 500**	**16 500**	**16 500**

Other investments

		depreciation period	annuel depreciation
Animals	630 000		
Harnessing	4 000	5	800
Dairy building	100 000	10	10 000
Generator	20 000	5	4 000
Breeding equipment	60 000	5	12 000
Total FF	**814 000**		**26 800**
Miscellaneous 10 %	**81 400**		**2 680**
Total FF	**895 400**		**29 480**

DEPRECIATIONS COST (FF)

years	**1**	**2**	**3**	**4**	**5**
building	5 500	8 250	11 000	13 750	16 500
other	29 480	29 480	29 480	29 480	29 480
annual total	34 980	37 730	40 480	43 230	45 980

FINANCIAL COSTS

years	**1**	**2**	**3**	**4**	**5**
investments	950 400	55 000	0	55 000	0
loan	1 000 000				
annual total	31 350	31 350	31 350	31 350	31 350
annuity	231 561	231 561	231 561	231 561	231 561
capital to reimburse	912 591	811 131	693 361	556 658	397 981
interest	144 152	130 101	113 791	94 858	72 884

mutual agreed

Simplified financial balance-sheet (FF)

Years	**1**	**2**	**3**	**4**	**5**	**6**
investments	950 400	55 000	0	55 000	0	
annual depreciation	34 980	37 730	40 480	43 230	45 980	45 980
Running charges	464 704	486 105	533 436	570 534	563 884	624 442
Total Charges	**499 684**	**523 835**	**573 916**	**613 764**	**609 864**	**670 422**
Products 5 FF	352 000	475 480	621 196	880 010	752 759	1 080 224
Products 8 FF	563 200	725 380	947 836	1 288 778	1 132 602	1 611 665
Products 10 FF	704 000	891 980	1 165 596	1 561 290	1 385 831	1 965 959
Products 16 FF	1 126 400	1 391 780	1 818 876	2 378 826	2 145 517	3 028 840
Balance 5 FF	-147 684	-48 355	47 280	266 245	142 895	409 802
Accumulation 5FF		**-196 039**	**-148 759**	**117 486**	**260 381**	**670 183**
Balance 8 FF	63 516	201 545	373 920	675 013	522 738	941 243
Accumulation 8FF		**265 061**	**638 981**	**1 313 994**	**1 836 732**	**2 777 975**
Balance 10 FF	204 316	368 145	591 680	947 525	775 967	1 295 537
Accumulation 10FF		**572 461**	**1 164 141**	**2 111 666**	**2 887 633**	**4 183 169**
Balance 16 FF	626 716	867 945	1 244 960	1 765 061	1 535 653	2 358 418
Accumulation 16FF		**1 494 661**	**2 739 621**	**4 504 682**	**6 040 335**	**8 398 753**

EXCHEQUER ACCOUNT

Charges (with loan interest)	464 704	486 105	533 436	570 534	563 884	624 442
annuity	231 561	231 561	231 561	231 561	231 561	231 561
interest (15%)	144 152	130 101	113 791	94 858	72 884	57 823
depreciation	34 980	37 730	40 480	43 230	45 980	45 980
product (8FF)	563 200	725 380	947 836	1 288 778	1 132 602	1 611 665
Products 10 FF	704 000	891 980	1 165 596	1 561 290	1 385 831	1 965 959
exchequer balance (8FF)	-207 257	-46 927	150 008	478 284	356 233	789 798
exchequer balance (10FF)	186 867	342 145	554 870	897 282	709 250	1 213 759

			Solde initial	Taux initial	Durée (années	1er Paiem	Valeur future
			1 000 000F	15,00%	7	Jan-2001	0F
Paiement	Date	Taux ann	Paiement C&I	Capital	Intérêt	Capital su	Nouveau solde
-	**********		-	-	-	-	1 000 000,00F
1	Jan-2001	15,00%	19 296,75F	6 796,75F	12 500,00F	0,00F	993 203,25F
2	Fév-2001	15,00%	19 296,75F	6 881,71F	12 415,04F	0,00F	986 321,54F
3	Mar-2001	15,00%	19 296,75F	6 967,73F	12 329,02F	0,00F	979 353,81F
4	Avr-2001	15,00%	19 296,75F	7 054,83F	12 241,92F	0,00F	972 298,98F
5	Mai-2001	15,00%	19 296,75F	7 143,01F	12 153,74F	0,00F	965 155,97F
6	Jun-2001	15,00%	19 296,75F	7 232,30F	12 064,45F	0,00F	957 923,67F
7	Jul-2001	15,00%	19 296,75F	7 322,70F	11 974,05F	0,00F	950 600,97F
8	**********	15,00%	19 296,75F	7 414,24F	11 882,51F	0,00F	943 186,73F
9	**********	15,00%	19 296,75F	7 506,92F	11 789,83F	0,00F	935 679,81F
10	Oct-2001	15,00%	19 296,75F	7 600,75F	11 696,00F	0,00F	928 079,06F
11	**********	15,00%	19 296,75F	7 695,76F	11 600,99F	0,00F	920 383,30F
12	**********	15,00%	19 296,75F	7 791,96F	11 504,79F	0,00F	912 591,34F
13	Jan-2002	15,00%	19 296,75F	7 889,36F	11 407,39F	0,00F	904 701,98F
14	Fév-2002	15,00%	19 296,75F	7 987,98F	11 308,77F	0,00F	896 714,00F
15	Mar-2002	15,00%	19 296,75F	8 087,82F	11 208,93F	0,00F	888 626,18F
16	Avr-2002	15,00%	19 296,75F	8 188,92F	11 107,83F	0,00F	880 437,26F
17	Mai-2002	15,00%	19 296,75F	8 291,28F	11 005,47F	0,00F	872 145,98F
18	Jun-2002	15,00%	19 296,75F	8 394,93F	10 901,82F	0,00F	863 751,05F
19	Jul-2002	15,00%	19 296,75F	8 499,86F	10 796,89F	0,00F	855 251,19F
20	**********	15,00%	19 296,75F	8 606,11F	10 690,64F	0,00F	846 645,08F
21	**********	15,00%	19 296,75F	8 713,69F	10 583,06F	0,00F	837 931,39F
22	Oct-2002	15,00%	19 296,75F	8 822,61F	10 474,14F	0,00F	829 108,78F
23	**********	15,00%	19 296,75F	8 932,89F	10 363,86F	0,00F	820 175,89F
24	**********	15,00%	19 296,75F	9 044,55F	10 252,20F	0,00F	811 131,34F
25	Jan-2003	15,00%	19 296,75F	9 157,61F	10 139,14F	0,00F	801 973,73F
26	Fév-2003	15,00%	19 296,75F	9 272,08F	10 024,67F	0,00F	792 701,65F
27	Mar-2003	15,00%	19 296,75F	9 387,98F	9 908,77F	0,00F	783 313,67F
28	Avr-2003	15,00%	19 296,75F	9 505,33F	9 791,42F	0,00F	773 808,34F
29	Mai-2003	15,00%	19 296,75F	9 624,15F	9 672,60F	0,00F	764 184,19F
30	Jun-2003	15,00%	19 296,75F	9 744,45F	9 552,30F	0,00F	754 439,74F
31	Jul-2003	15,00%	19 296,75F	9 866,25F	9 430,50F	0,00F	744 573,49F
32	**********	15,00%	19 296,75F	9 989,58F	9 307,17F	0,00F	734 583,91F
33	**********	15,00%	19 296,75F	10 114,45F	9 182,30F	0,00F	724 469,46F
34	Oct-2003	15,00%	19 296,75F	10 240,88F	9 055,87F	0,00F	714 228,58F
35	**********	15,00%	19 296,75F	10 368,89F	8 927,86F	0,00F	703 859,69F
36	**********	15,00%	19 296,75F	10 498,50F	8 798,25F	0,00F	693 361,19F
37	Jan-2004	15,00%	19 296,75F	10 629,74F	8 667,01F	0,00F	682 731,45F
38	Fév-2004	15,00%	19 296,75F	10 762,61F	8 534,14F	0,00F	671 968,84F
39	Mar-2004	15,00%	19 296,75F	10 897,14F	8 399,61F	0,00F	661 071,70F
40	Avr-2004	15,00%	19 296,75F	11 033,35F	8 263,40F	0,00F	650 038,35F
41	Mai-2004	15,00%	19 296,75F	11 171,27F	8 125,48F	0,00F	638 867,08F
42	Jun-2004	15,00%	19 296,75F	11 310,91F	7 985,84F	0,00F	627 556,17F
43	Jul-2004	15,00%	19 296,75F	11 452,30F	7 844,45F	0,00F	616 103,87F
44	**********	15,00%	19 296,75F	11 595,45F	7 701,30F	0,00F	604 508,42F
45	**********	15,00%	19 296,75F	11 740,39F	7 556,36F	0,00F	592 768,03F
46	Oct-2004	15,00%	19 296,75F	11 887,15F	7 409,60F	0,00F	580 880,88F
47	**********	15,00%	19 296,75F	12 035,74F	7 261,01F	0,00F	568 845,14F
48	**********	15,00%	19 296,75F	12 186,19F	7 110,56F	0,00F	556 658,95F
49	Jan-2005	15,00%	19 296,75F	12 338,51F	6 958,24F	0,00F	544 320,44F
50	Fév-2005	15,00%	19 296,75F	12 492,74F	6 804,01F	0,00F	531 827,70F
51	Mar-2005	15,00%	19 296,75F	12 648,90F	6 647,85F	0,00F	519 178,80F
52	Avr-2005	15,00%	19 296,75F	12 807,01F	6 489,74F	0,00F	506 371,79F
53	Mai-2005	15,00%	19 296,75F	12 967,10F	6 329,65F	0,00F	493 404,69F
54	Jun-2005	15,00%	19 296,75F	13 129,19F	6 167,56F	0,00F	480 275,50F
55	Jul-2005	15,00%	19 296,75F	13 293,31F	6 003,44F	0,00F	466 982,19F

Intérêt cumulé	Int. total annuel
12 500,00F	12 500,00F
24 915,04F	24 915,04F
37 244,06F	37 244,06F
49 485,98F	49 485,98F
61 639,72F	61 639,72F
73 704,17F	73 704,17F
85 678,22F	85 678,22F
97 560,73F	97 560,73F
109 350,56F	109 350,56F
121 046,56F	121 046,56F
132 647,55F	132 647,55F
144 152,34F	144 152,34F
155 559,73F	11 407,39F
166 868,50F	22 716,16F
178 077,43F	33 925,09F
189 185,26F	45 032,92F
200 190,73F	56 038,39F
211 092,55F	66 940,21F
221 889,44F	77 737,10F
232 580,08F	88 427,74F
243 163,14F	99 010,80F
253 637,28F	109 484,94F
264 001,14F	119 848,80F
274 253,34F	130 101,00F
284 392,48F	10 139,14F
294 417,15F	20 163,81F
304 325,92F	30 072,58F
314 117,34F	39 864,00F
323 789,94F	49 536,60F
333 342,24F	59 088,90F
342 772,74F	68 519,40F
352 079,91F	77 826,57F
361 262,21F	87 008,87F
370 318,08F	96 064,74F
379 245,94F	104 992,60F
388 044,19F	113 790,85F
396 711,20F	8 667,01F
405 245,34F	17 201,15F
413 644,95F	25 600,76F
421 908,35F	33 864,16F
430 033,83F	41 989,64F
438 019,67F	49 975,48F
445 864,12F	57 819,93F
453 565,42F	65 521,23F
461 121,78F	73 077,59F
468 531,38F	80 487,19F
475 792,39F	87 748,20F
482 902,95F	94 858,76F
489 861,19F	6 958,24F
496 665,20F	13 762,25F
503 313,05F	20 410,10F
509 802,79F	26 899,84F
516 132,44F	33 229,49F
522 300,00F	39 397,05F
528 303,44F	45 400,49F

56	**********	15,00%	19 296,75F	13 459,47F	5 837,28F	0,00F	453 522,72F
57	**********	15,00%	19 296,75F	13 627,72F	5 669,03F	0,00F	439 895,00F
58	Oct-2005	15,00%	19 296,75F	13 798,06F	5 498,69F	0,00F	426 096,94F
59	**********	15,00%	19 296,75F	13 970,54F	5 326,21F	0,00F	412 126,40F
60	**********	15,00%	19 296,75F	14 145,17F	5 151,58F	0,00F	397 981,23F
61	Jan-2006	15,00%	19 296,75F	14 321,98F	4 974,77F	0,00F	383 659,25F
62	Fév-2006	15,00%	19 296,75F	14 501,01F	4 795,74F	0,00F	369 158,24F
63	Mar-2006	15,00%	19 296,75F	14 682,27F	4 614,48F	0,00F	354 475,97F
64	Avr-2006	15,00%	19 296,75F	14 865,80F	4 430,95F	0,00F	339 610,17F
65	Mai-2006	15,00%	19 296,75F	15 051,62F	4 245,13F	0,00F	324 558,55F
66	Jun-2006	15,00%	19 296,75F	15 239,77F	4 056,98F	0,00F	309 318,78F
67	Jul-2006	15,00%	19 296,75F	15 430,27F	3 866,48F	0,00F	293 888,51F
68	**********	15,00%	19 296,75F	15 623,14F	3 673,61F	0,00F	278 265,37F
69	**********	15,00%	19 296,75F	15 818,43F	3 478,32F	0,00F	262 446,94F
70	Oct-2006	15,00%	19 296,75F	16 016,16F	3 280,59F	0,00F	246 430,78F
71	**********	15,00%	19 296,75F	16 216,37F	3 080,38F	0,00F	230 214,41F
72	**********	15,00%	19 296,75F	16 419,07F	2 877,68F	0,00F	213 795,34F
73	Jan-2007	15,00%	19 296,75F	16 624,31F	2 672,44F	0,00F	197 171,03F
74	Fév-2007	15,00%	19 296,75F	16 832,11F	2 464,64F	0,00F	180 338,92F
75	Mar-2007	15,00%	19 296,75F	17 042,51F	2 254,24F	0,00F	163 296,41F
76	Avr-2007	15,00%	19 296,75F	17 255,54F	2 041,21F	0,00F	146 040,87F
77	Mai-2007	15,00%	19 296,75F	17 471,24F	1 825,51F	0,00F	128 569,63F
78	Jun-2007	15,00%	19 296,75F	17 689,63F	1 607,12F	0,00F	110 880,00F
79	Jul-2007	15,00%	19 296,75F	17 910,75F	1 386,00F	0,00F	92 969,25F
80	**********	15,00%	19 296,75F	18 134,63F	1 162,12F	0,00F	74 834,62F
81	**********	15,00%	19 296,75F	18 361,32F	935,43F	0,00F	56 473,30F
82	Oct-2007	15,00%	19 296,75F	18 590,83F	705,92F	0,00F	37 882,47F
83	**********	15,00%	19 296,75F	18 823,22F	473,53F	0,00F	19 059,25F
84	**********	15,00%	19 296,75F	19 058,51F	238,24F	0,00F	0,74F
				999 999,26F	620 927,74F	0,00F	48 674 217,27F